ABSTRACT

Unsymmetrical cyanine dyes that incorporate an aza-benzazolium ring moiety are described, including cyanine dyes substituted by a cationic side chain, monomeric and dimeric cyanine dyes, chemically reactive cyanine dyes, and conjugates of cyanine dyes. The subject dyes are virtually non-fluorescent when diluted in aqueous solution, but exhibit bright fluorescence when associated with nucleic acid polymers such as DNA or RNA, or when associated with detergent-complexed proteins. A variety of applications are described for detection and quantitation of nucleic acids and detergent-complexed proteins in a variety of samples, including solutions, electrophoretic gels, cells, and microorganisms.